# Homework #9, PHY 674, 17 November 1995

(X42). For the point groups $O$, $O_h$, $T_d$, $D_{2h}$, and $D_{4h}$, find the compatibility tables of the single- and double-valued representations at $\vec{k} = 0$. How do the various states split under spin-orbit splitting ?

(X43). In the diamond and zinc blende structure, how does a state at $\vec{k} = 0$ with symmetry $\Gamma_i$ ($i$=1,...,8) split along the (100)- and (111)-directions. (Hint: Find the compatibility tables of $^dO_h$ and $^dT_d$ with the proper little groups.) Do the states at the $X$- and $L$-points split along $\Delta$ and $\Lambda$ (towards the zone center) ?

## Due Date:
## Friday, 1 December 1995, 2:10 pm
## in the green box in Room 12 (or in class).